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NEWSLETTER

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TASCC

News about Chalk River's Tandem Accelerator Superconducting Cyclotron facility for users and potential users

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TRC to become PAC

The Nuclear Physics Technical Review Committee (TRC), which has visited TASCC annually since 1987, will be changing its focus and its name this year. When it meets on May 17-19, it will be a Program Advisory Committee (PAC).

The TRC has always heard presentations from most research programs, had private discussions with researchers, and written a report assessing the quality of research and recommending improvements. Although it has looked to the future, its main focus was to review past performance. This has worked very effectively as TASCC users were building their research programs around a new accelerator facility.

Now, as requests for TASCC beam time are increasing in number and diversity, it is necessary to shift the committee's perspective more toward the future. The most important change is that the new PAC's advice will be sought in allotting beam time to broad program areas and in assigning resources to future development.

TASCC director, John Hardy, emphasizes that he does not want this new process to reduce the flexibility that TASCC has always offered in getting experiments on-line quickly. The PAC will not assign time to individual experiments but rather to research programs. This will allow experimental groups to continue to respond rapidly to new developments.

The international makeup of the PAC will be the same as it was for the TRC. This year's members are: Ed Tomusiak (Chair); Jasper McKee; Joe Natowitz; Jerry Nolen; Ernst Roeckl, and Peter Twin.

Facility report

Six experimental runs plus a cyclotron beam-development run were scheduled during March.

Freezing rain on March 7 caused a 2-1/2 hour partial electrical outage when a tree branch collapsed onto a power line.

The cyclotron stripper-foil system has been rebuilt with a new chain, and an extension has been added to allow foils to be positioned beyond the original design range, for acceleration of helium.

Radiation-protection training courses, ultimately to be taken by most TASCC staff, have begun. The training, from five to seven days in duration, is required under new regulations governing all AECL employees.

Beams produced during March were:

Ion	Energy (MeV)
^{12}C	264 & 276
^{28}Si	756
^{29}Si	150
Cl	100
I	50
^{127}I	235
^{197}Au	250

Memo of understanding signed with CRN

TASCC has just signed a *Memorandum of Understanding* with the Centre Recherche Nucléaires, Strasbourg. The two labs have promised cooperation in "the field of ion sources for a Tandem accelerator plus other aspects of accelerator and nuclear research."

The form of cooperation for all aspects of the

memorandum will include the exchange of experts, progress reports and other non-confidential scientific and technical information, plus collaboration in research.

Signed by directors Francis Beck (CRN) and John Hardy (TASCC), the memo comes into effect 1995 April 1 and remains in force for three years.

Interactive graphical analysis software to be demonstrated

Two programs written by TASC's David Radford will be demonstrated at the "Radware" school offered at Chalk River Laboratories June 28 to July 1. (Details on the course are given in the 1995 January newsletter).

The programs, ESCL8R and LEVIT8R, allow analysis of γ - γ matrices and γ - γ - γ cubes from HPGe coincidence experiments in high-spin spectroscopy studies. They are currently being used in many heavy-ion laboratories around the world.

With the programs, users can inspect background-subtracted gated spectra, or combinations of such spectra, quickly and easily.

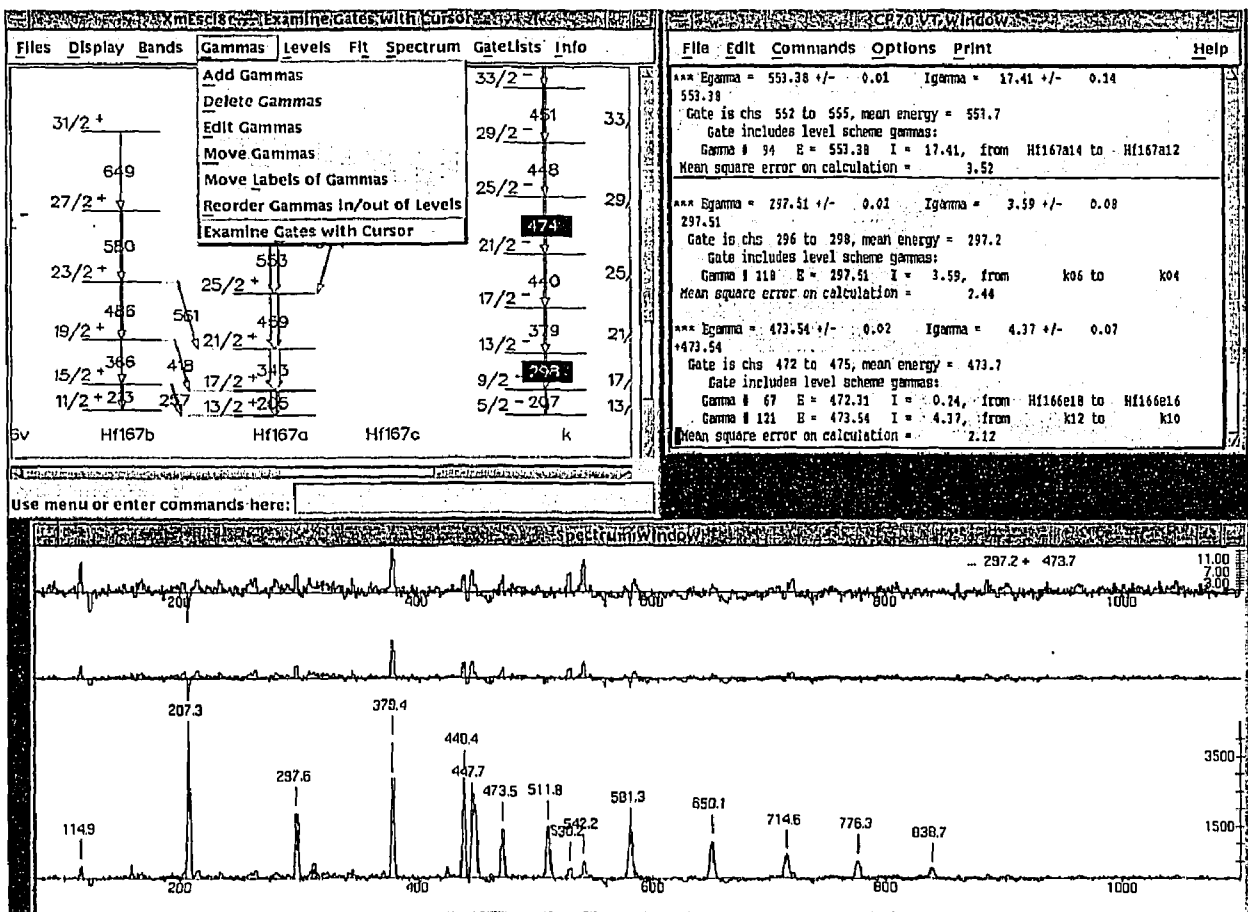
Both programs make use of a proposed level scheme, provided by the user, to calculate an expected spectrum for comparison with the observed spectrum. Electron conversion coefficients, detection efficiency and γ -ray energy calibrations are included in the calculation, as are parameterized values of peak shapes and peak widths.

A graphics-based editor is included to allow fast and easy modification to the proposed level scheme, and least-squares fits can be performed to the matrix or cube to extract optimum values for the energies and intensities of the level scheme transitions. Up to 500 parameters can be fitted simultaneously.

With both programs, the level scheme can be easily printed in the form of a postscript figure. Tables of the level and transition data, including tests of energy sums and intensity balances, can also be generated quickly and easily. This approach considerably improves the ease, speed and reliability of detailed data analysis, especially in extracting "complete" level schemes from higher-fold data sets.

ESCL8R, LEVIT8R and associated programs run on both VMS and Unix platforms.

Copies of the code are available by anonymous ftp from [cul.crl.aec.ca](ftp://cul.crl.aec.ca) or by contacting David Radford by e-mail at RadfordD@crl.aec.ca.



Screen dump of an ESCL8R session. The top right shows a terminal-emulator window; the top left shows the level scheme and graphical-user interface; the bottom window displays spectra. Observed and predicted spectra are overlaid in colour.

March experiments

Experiment	Measurement of background yield for continuing study of pionic fusion with heavy ions. Data obtained on an isotopically pure ^{12}C target and a MoO_2 target (near the threshold for pion production from the $^{12}\text{C} + ^{12}\text{C}$ fusion reaction) have established that the background from light-element contaminants in the ^{12}C target is the limiting factor in determining the cross section.
Researchers	D. Horn, G.C. Ball, D. Bowman, W.G. Davies, D. Fox, A. Galindo-Uribarri and G. Savard (<i>TASCC</i>); C. St.-Pierre and L. Beaulieu (<i>Université Laval</i>)
Beams	22 and 23 MeV/A ^{12}C
Duration	6 days
Experiment	Measurement of chlorine-36 content and iodine-129 content of samples such as moderator water, environmental samples from Chernobyl, and samples for comparison between international laboratories. Elastic recoil detection (ERD) studies were also performed of cesium deposition and desorption on simulated ion-source components.
Researchers	H.R. Andrews, W.G. Davies, B.F. Greiner, Y. Imahori, V.T. Koslowsky, J.W. McKay and J.C.D. Milton (<i>TASCC</i>); R.J.J. Cornett, L.A. Chant, G.M. Milton and E. Romaniszyn (<i>Environmental Research Branch, CRL</i>)
Beams	100 MeV Cl; 50 MeV I; 250 MeV ^{197}Au
Duration	5 days
Experiment	Study of ridge structure of osmium-178 with the 8π spectrometer. Preliminary analysis shows that the strong E_γ - E_γ correlation ridges seen previously in Os-180 and W-174 are not present in Os-178.
Researchers	T.E. Drake, J. DeGraaf and M. Cromaz (<i>University of Toronto</i>); D. Ward (<i>TASCC</i>); G. Hackman, J. Wilson and S.M. Mullins (<i>McMaster University</i>)
Beam	150 MeV ^{29}Si
Duration	5 days
Experiment	Test of beam effects on a high-gradient, small-aperture Einzel lens.
Researchers	W.T. Diamond (<i>TASCC</i>)
Beam	235 MeV ^{127}I
Duration	1 day
Experiment	Test of a position-sensitive photomultiplier tube for single-event-effect measurements.
Researchers	H.R. Andrews, J.S. Geiger and V.T. Koslowsky (<i>TASCC</i>)
Beam	235 MeV ^{127}I
Duration	1 day
Experiment	RCE (resonant coherent excitation) study of hydrogenic silicon ions channeled along the $\langle 111 \rangle$ and $\langle 112 \rangle$ axes of a thin silicon crystal.
Researchers	J.S. Forster, G.C. Ball, W.G. Davies and J.S. Geiger (<i>TASCC</i>); J.A. Davies (<i>McMaster University</i>)
Beam	27 MeV/A ^{28}Si
Duration	5 days
Experiment	Cyclotron beam development to increase the yield of 27 MeV/A silicon and the extraction efficiency of 23 MeV/A carbon-12 by beam-centering adjustments.
Researchers	TASCC Beam Commissioning Team (<i>TASCC</i>)
Beams	27 MeV/A ^{28}Si ; 23 MeV/A ^{12}C
Duration	5 days

"STRIVING FOR EXCELLENCE MOTIVATES YOU; STRIVING FOR PERFECTION IS
DEMORALIZING."

HARRIET BRAIKER, "THE TYPE E. WOMAN"

Next month

- Study of lifetimes in antimony-109
- Study of decay of silicon-25 and titanium-42
- Cyclotron beam development
- ERD analyses with heavy ions

Facility operating record

Elapsed Time (Year-to-date) 2208 h

Beam Available	
Tandem Only	949
Tandem + Cyclotron	451.5
Beam Preparation	385.5
Beam Development	186
Planned Shutdown	145
Unplanned Shutdown	91

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